Pre-AP Geometry

Postulates, Theorems, and Corollaries Chapter 4

Thm. 4-3-1 **Triangle Sum Theorem** The sum of the angle measures of a triangle is 180°.

Cor. 4-3-2 The acute angles of a right triangle are complementary.

Cor. 4-3-3 The measure of each angle of an equiangular triangle is 60°.

Thm. 4-3-4 **Exterior Angle Theorem** The measure of an exterior angle of a triangle is equal to the sum of the measures of its remote interior angles.

Thm. 4-3-5 **Third Angles Theorem** If two angles of one triangle are congruent to two angles of another triangle, then the third pair of angles are congruent.

Post. 4-5-1 **Side-Side-Side (SSS) Congruence Postulate** If three sides of one triangle are congruent to three sides of another triangle, then the triangles are congruent.

Post. 4-5-2 **Side-Angle-Side (SAS) Congruence Postulate** If two sides and the included angle of one triangle are congruent to two sides and the included angle of another triangle, then the triangles are congruent.

Post. 4-6-1 **Angle-Side-Angle (ASA) Congruence Postulate** If two angles and the included side of one triangle are congruent to two angles and the included side of another triangle, then the triangles are congruent.

Thm. 4-6-2 **Angle-Angle-Side (AAS) Congruence Theorem** If two angles and a nonincluded side of one triangle are congruent to the corresponding angles and nonincluded side of another triangle, then the triangles are congruent.

Thm. 4-6-3 **Hypotenuse-Leg (HL) Congruence Theorem** If the hypotenuse and a leg of a right triangle are congruent to the hypotenuse and a leg of another right triangle, then the triangles are congruent.

Thm. 4-9-1 **Isosceles Triangle Theorem** If two sides of a triangle are congruent, then the angles opposite the sides are congruent.

Thm. 4-9-2 **Converse of the Isosceles Triangle Theorem** If two angles of a triangle are congruent, then the sides opposite those angles are congruent.

Cor. 4-9-3 If a triangle is equilateral, then it is equiangular.

Cor. 4-9-4 If a triangle is equiangular, then it is equilateral.

Pre-AP Geometry

Postulates, Theorems, and Corollaries Chapter 3

Post. 3-2-1 **Corresponding Angles Postulate** If two parallel lines are cut by a transversal, then the pairs of corresponding angles are congruent.

Thm. 3-2-2 **Alternate Interior Angles Theorem** If two parallel lines are cut by a transversal, then the pairs of alternate interior angles are congruent.

Thm. 3-2-3 **Alternate Exterior Angles Theorem** If two parallel lines are cut by a transversal, then the two pairs of alternate exterior angles are congruent.

Thm. 3-2-4 **Same-Side Interior Angles Theorem** If two parallel lines are cut by a transversal, then the two pairs of same-side interior angles are supplementary.

Post. 3-3-1 **Converse of the Corresponding Angles Postulate** If two coplanar lines are cut by a transversal so that a pair of corresponding angles are congruent, then the two lines are parallel.

Post. 3-3-2 **Parallel Postulate** Through a point P not on line ℓ, there is exactly one line parallel to ℓ.

Thm. 3-3-3 **Converse of the Alternate Interior Angles Theorem** If two coplanar lines are cut by a transversal so that a pair of alternate interior angles are congruent, then the two lines are parallel.

Thm. 3-3-4 **Converse of the Alternate Exterior Angles Theorem** If two coplanar lines are cut by a transversal so that a pair of alternate exterior angles are congruent, then the two lines are parallel.

Thm. 3-3-5 **Converse of the Same-Side Interior Angles Theorem** If two coplanar lines are cut by a transversal so that a pair of same-side interior angles are supplementary, then the two lines are parallel.

Thm. 3-4-1 If two intersecting lines form a linear pair of congruent angles, then the lines are perpendicular.

Thm. 3-4-2 **Perpendicular Transversal Theorem** In a plane, if a transversal is perpendicular to one of two parallel lines, then it is perpendicular to the other line.

Thm. 3-4-3 If two coplanar lines are perpendicular to the same line, then the two lines are parallel to each other.

Thm. 3-5-1 **Parallel Lines Theorem** In a coordinate plane, two nonvertical lines are parallel if and only if they have the same slope. Any two vertical lines are parallel.

Thm. 3-5-2 **Perpendicular Lines Theorem** In a coordinate plane, two nonvertical lines are perpendicular if and only if the product of their slopes is -1. Vertical and horizontal lines are perpendicular.

Pre-AP Geometry

Postulates, Theorems, and Corollaries Chapter 2

Thm. 2-6-1 **Linear Pair Theorem** If two angles form a linear pair, then they are supplementary.

Thm. 2-6-2 **Congruent Supplements Theorem** If two angles are supplementary to the same angle (or to two congruent angles), then the two angles are congruent.

Thm. 2-6-3 **Right Angle Congruence Theorem** All right angles are congruent.

Thm. 2-6-4 **Congruent Complements Theorem** If two angles are complementary to the same angle (or to two congruent angles), then the two angles are congruent.

Thm. 2-7-1 **Common Segments Theorem** Given collinear points A, B, C, and D arranged as shown, if $\overline{AB} \cong \overline{CD}$, then $\overline{AC} \cong \overline{BD}$.

Thm. 2-7-2 **Vertical Angles Theorem** Vertical angles are congruent.

Thm. 2-7-3 If two congruent angles are supplementary, then each angle is a right angle.

Postulates, Theorems, and Corollaries Chapter 1

Post. 1-1-1 Through any two points there is exactly one line.

Post. 1-1-2 Through any three noncollinear points there is exactly one plane containing them.

Post. 1-1-3 If two points lie in a plane, then the line containing those points lies in the plane.

Post. 1-1-4 If two lines intersect, then they intersect in exactly one point.

Post. 1-1-5 If two planes intersect, then they intersect in exactly one line.

Post. 1-2-1 **Ruler Postulate** The points on a line can be put into a one-to-one correspondence with the real numbers.

Post. 1-2-2 **Segment Addition Postulate** If B is between A and C, then $AB + BC = AC$.

Post. 1-3-1 **Protractor Postulate** Given $\overleftrightarrow{AB}$ and a point O on $\overleftrightarrow{AB}$, all rays that can be drawn from O can be put into a one-to-one correspondence with the real numbers from 0 to 180.

Post. 1-3-2 **Angle Addition Postulate** If S is in the interior of $\angle PQR$, then $m\angle PQS + m\angle SQR = m\angle PQR$.

Thm. 1-6-1 **Pythagorean Theorem** In a right triangle, the sum of the squares of the lengths of the legs is equal to the square of the length of the hypotenuse.